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Understanding Where We Live and How We Travel

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Understanding Where We Live and How We Travel:

The Development of an Online Visual Survey Tool for Evaluating Preferences in Residential Neighborhood Choice and Commute.

Kristina M. Currans

Friday Transportation Seminar

October 17th, 2014

About the Speaker

- Doctoral Student
- Civil Engineering (CE)
- Portland State University

- Dwight D. Eisenhower Fellow
- Advisor: Dr. Kelly Clifton (2010-Present)
- M.S. @ Portland State University (CE, 2013)
- B.S. @ Oregon State University (CE, 2010)

About the Project

Understanding Residential Location Choices for Climate Change and Transportation Decision Making (2011-Present)

Dr. Kelly J. Clifton (PI)

Funded in part:

- Oregon Department of Transportation (ODOT)
- National Institute for Transportation and Communities (NITC)

Introduction

This project includes several surveys which investigate preferences for certain residential environments and trade-offs made when selecting where to live and how to travel.

Objective:

Improve the **representation of neighborhoods** in surveys by developing a **visual tool** to depict objectively-defined neighborhoods for a non-technical audience.

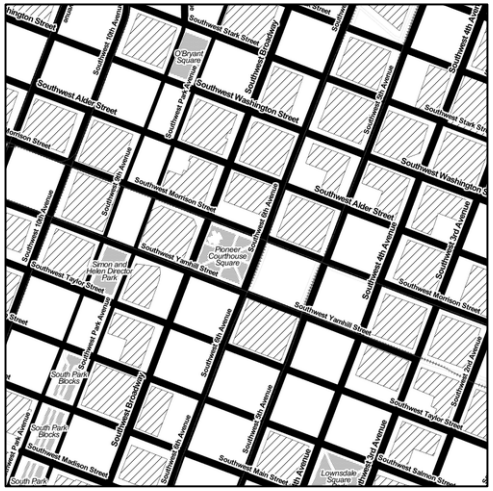
Outline

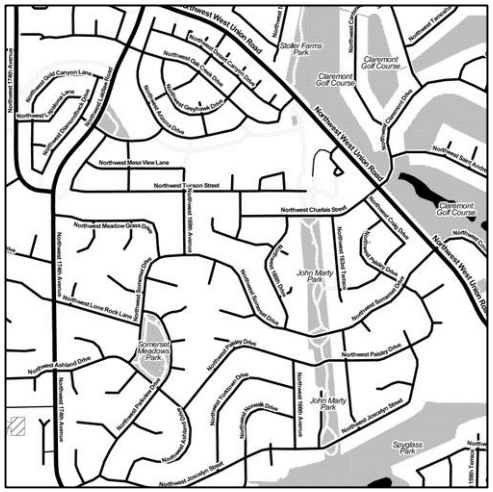
- How to Describe Neighborhoods
- Developing a Visual Neighborhood Survey Tool
  1. Objectively define neighborhood types
  2. Compile image sets
  3. Validate visual tool
  4. Revise and apply tool in practical surveys
- Conclusions
- Lesson's Learned
- Future Work

How to Describe Neighborhoods

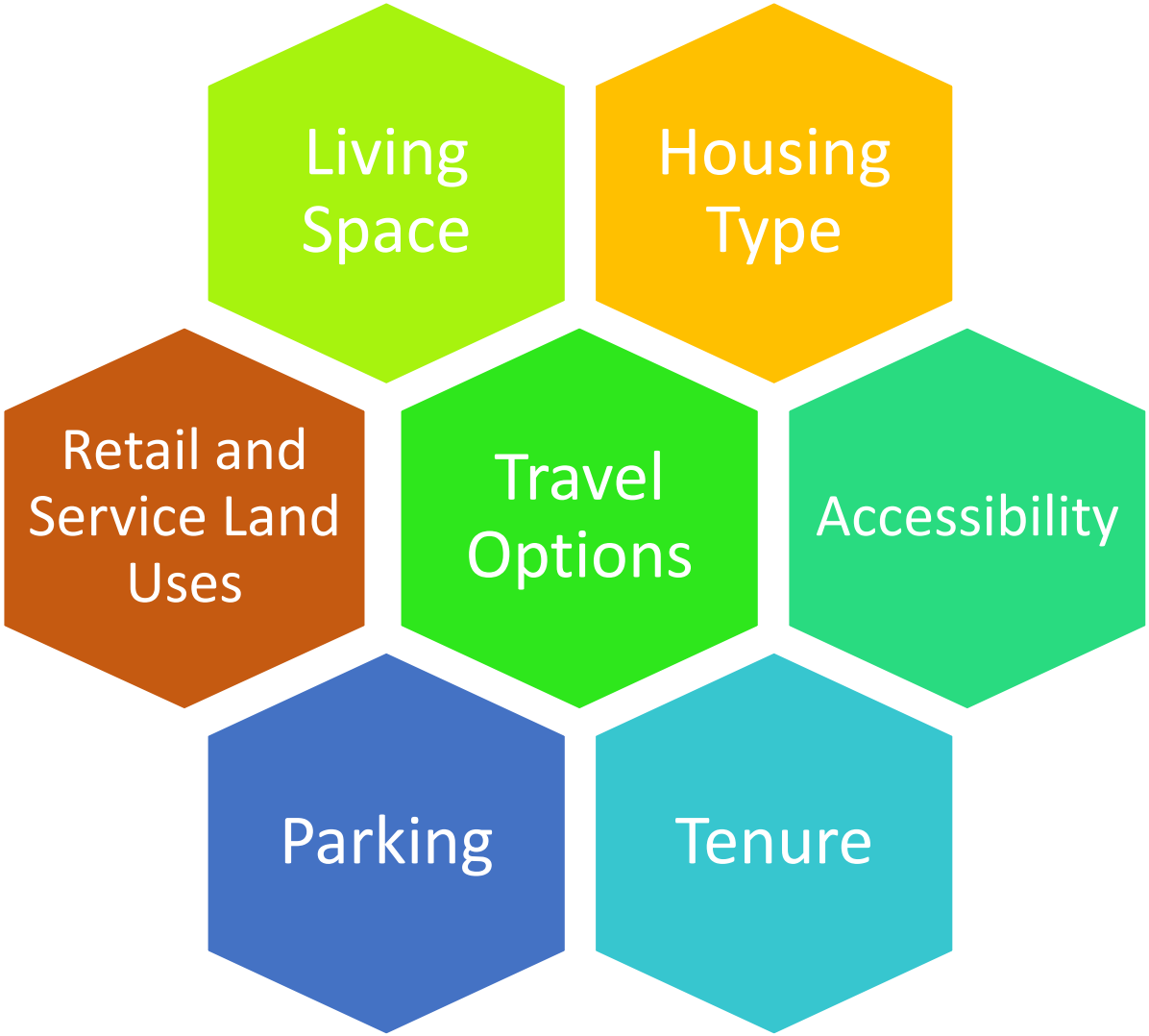
Engineers and planners describe neighborhoods using **discrete attributes**:

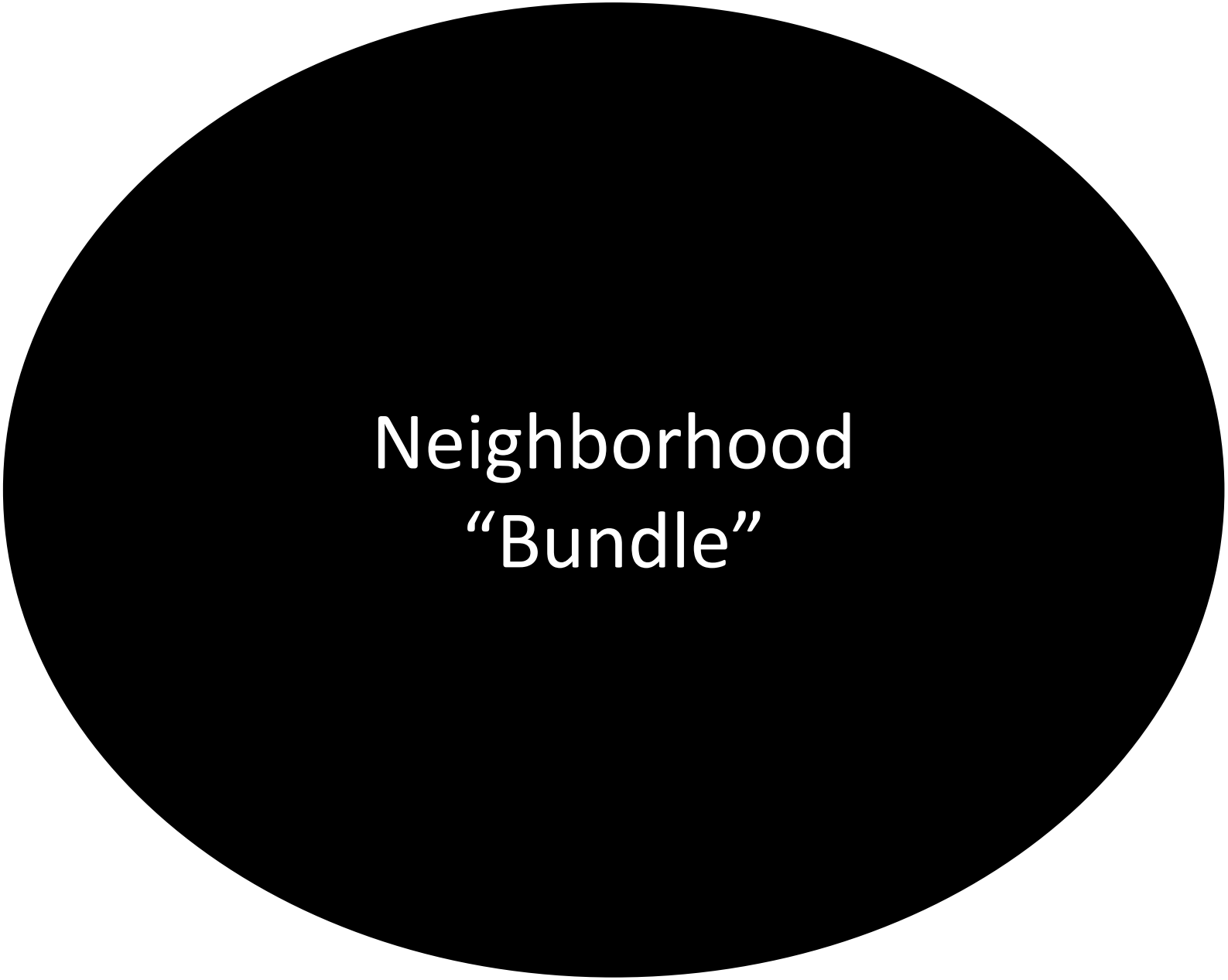
- Activity or intersection density
- Curb cuts
- Mixed use
- Floor-to-area ratio
- Lot size





(Image Source: Stamen Maps)


Living Space
Housing Type
Retail and Service Land Uses
Travel Options
Accessibility
Parking
Tenure


Neighborhood
“Bundle”

How to Describe Neighborhoods

People who are not transportation professionals experience neighborhoods as a **bundle**.

One way to depict these complex relationships it through the use of **images**.

Using Images to Depict the Bundle

Depict qualities that are hard to measure[1,2]:

- Enclosure
- Human Scale
- Architecture

Or difficult to conceptualize[2]:

- Density
- Entropy

And can relate complex arrangements of characteristics[1,2].

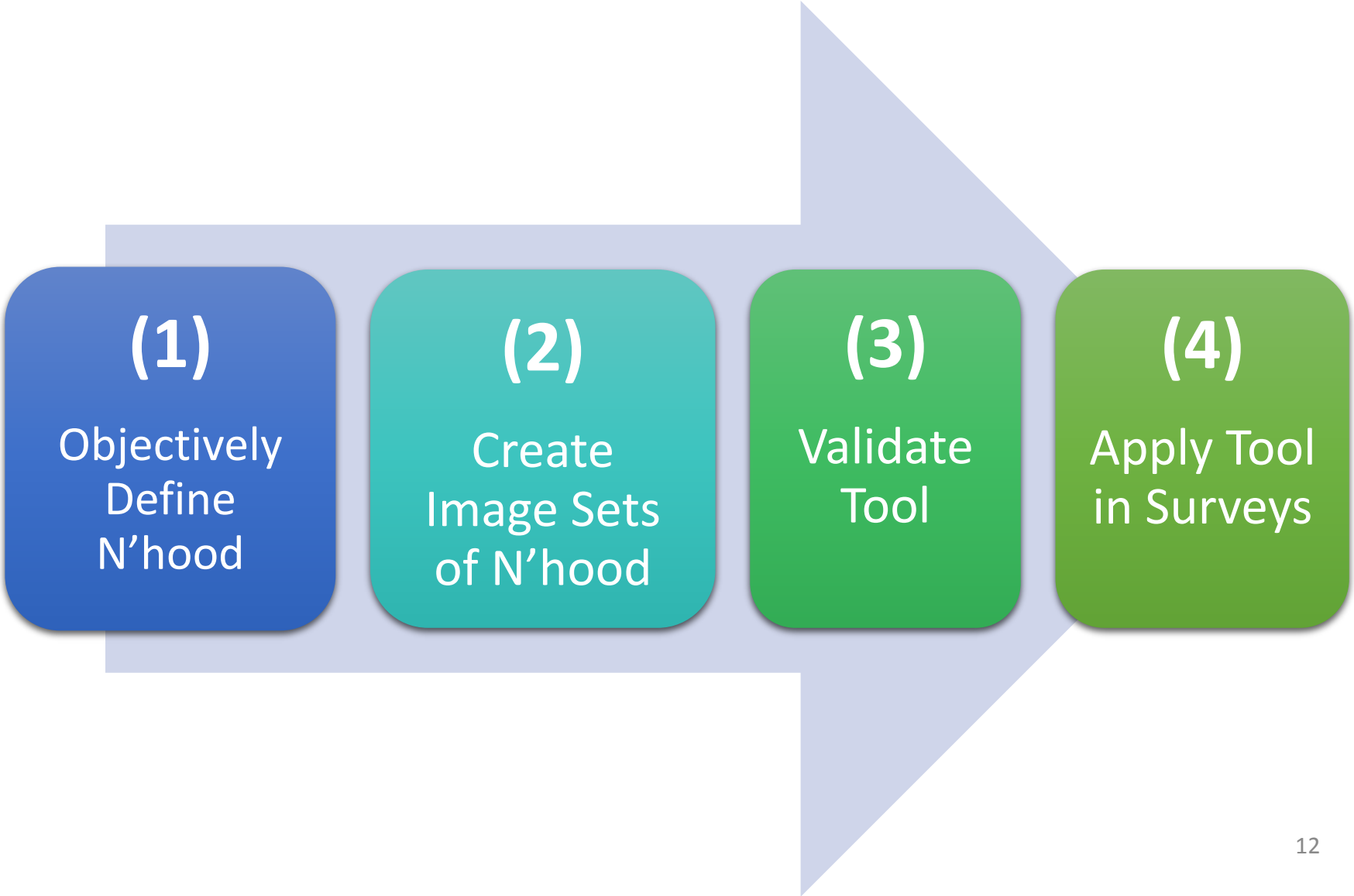
[1](Ewing & Handy, 2009); [2](Jansen, 2009)

Using Images to Depict the Bundle[1]

- Captures vague concepts
- Help participants appreciate words
- “Enhance the realism of the task”
- Reduce information overload
- Provide interesting comparisons with less fatigue
- May be expected in a society accustomed to imagery
- Ground participants in a similar reality

[1](Jansen, 2009)

Developing the Visual Neighborhood Tool



(1) Objectively define neighborhood

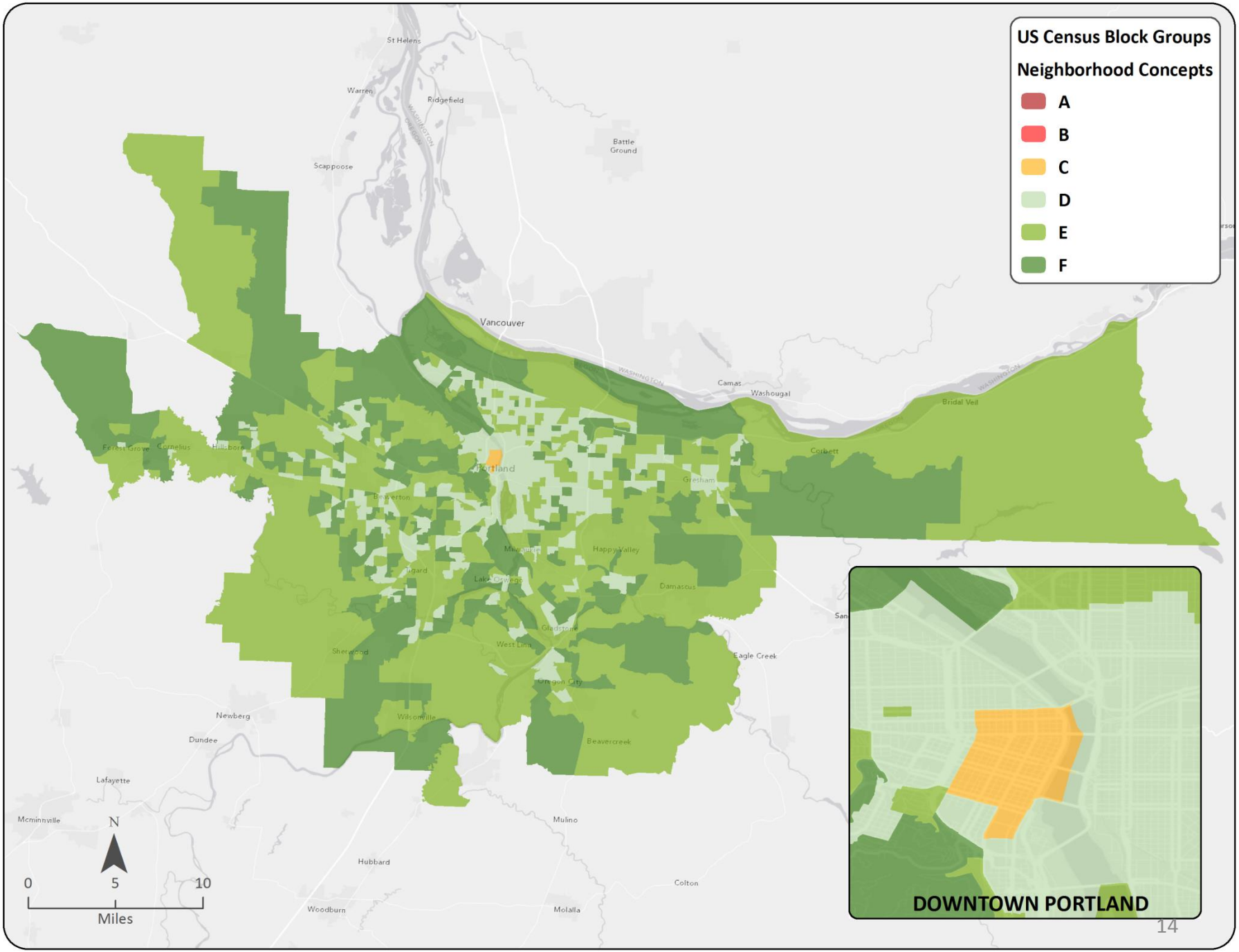
- Quantitatively classify environments into discrete categories
  - Commonly available data (Smart Growth Database[1]) to describe the environment

    Density: Activity Density

    Diversity: 5-Category Employment Entropy

    Design: Intersection Density
  - Representing environments found throughout the United States (top 25 highest population MPOs)

[1](EPA, 2012)


US Census Block Groups
Neighborhood Concepts
A
B
C
D
E
F
St Helens
Warren
Ridgefield
Battle Ground
Scappoose
Vancouver
Camas
Washougal
Bridal Veil
Corbett
Forest Grove
Cornelius
Hillsboro
Portland
Gresham
Beaverton
Happy Valley
Tigard
Lake Oswego
Damascus
Gladstone
West Linn
Sherwood
Eagle Creek
Oregon City
Newberg
Wilsonville
Dundee
Beavercreek
Lafayette
Mcminnville
Mulino
Hubbard
Colton
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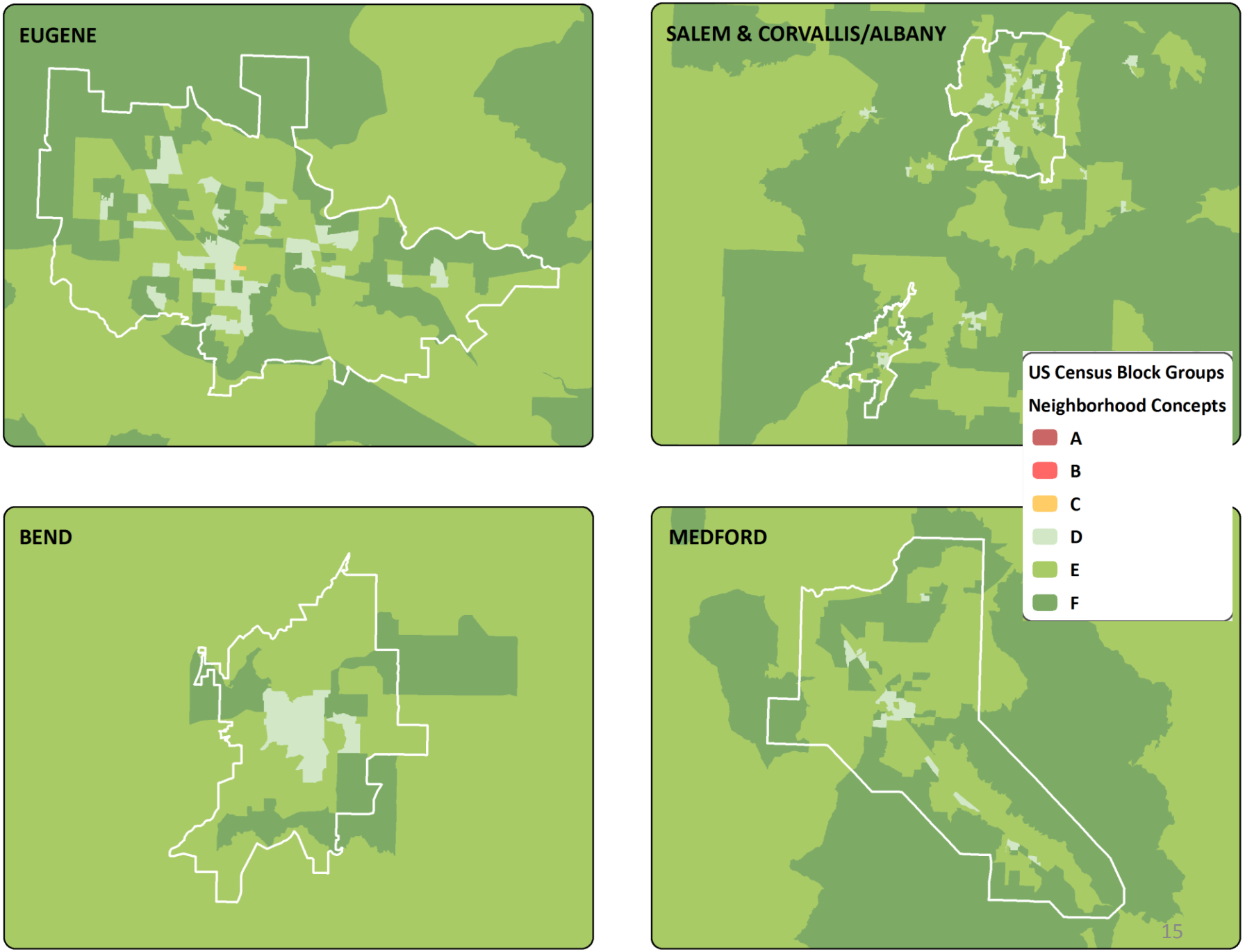
DOWNTOWN PORTLAND

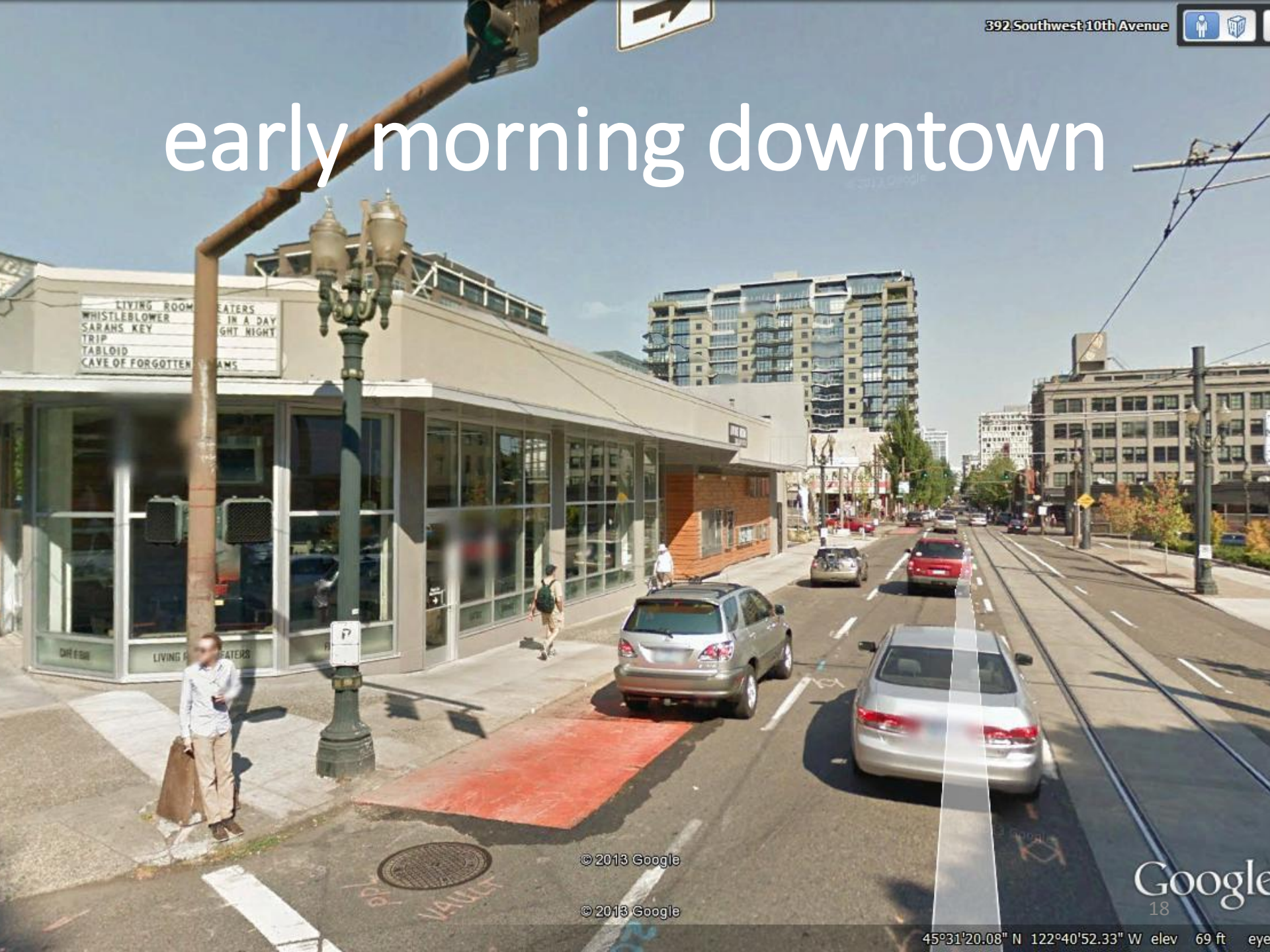

EUGENE
SALEM & CORVALLIS/ALBANY
US Census Block Groups
Neighborhood Concepts
A
B
C
D
E
F
BEND
MEDFORD

(2) Create Image Sets

- Collect images of environment located within each neighborhood (Google Earth Streetview, screenshots)
- Integrating images of the residential, transportation, land use, and recreational options
- Portray the neighborhood in the best possible light

(2) Create Image Sets

- Control for the use of images that have:
  - specific cultural significance
  - uniquely identify a particular region
  - explicitly describe a place
  - potentially elicit individual biases



early morning downtown


early morning downtown

car-centric viewpoint


adequately depict neighborhood
U.S. 101
U.S. 101
© 2014 Google
Terms of Use

continuity of neighborhood


including people
FOOD • GAMES • DRINKS
OREGON LOTTERY
SE 34TH AV

F

D


Google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BELMONT INN


BAGDAD
BAGDAD
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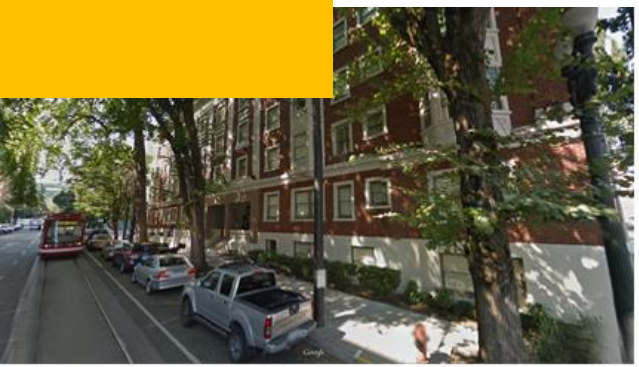
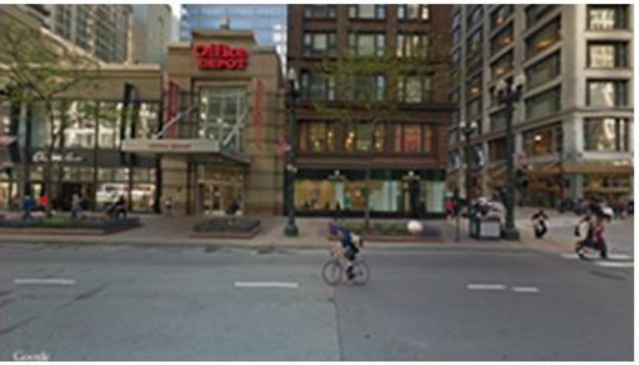




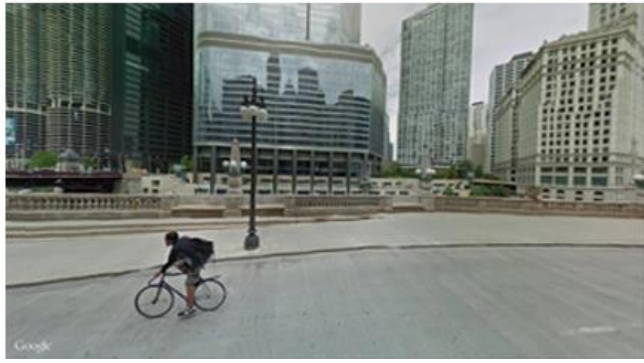



AB





(3) Validate Image Sets

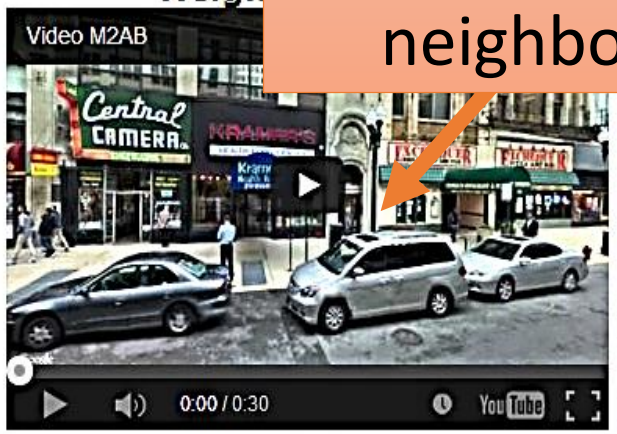
When using imagery to depict “neighborhood” choices within a survey (and all the characteristics bundled within neighborhood) in what ways are respondents grounded in the same reality?

- What differences in characteristics of neighborhood do respondents see?
- Do respondents generally see the same differences?

(3) Validate Image Sets

Present two slideshows representing two neighborhood concepts

Based on your general impressions of these neighl … ikely to have:



No Difference/ Cannot Distinguish

larger private yards	○	○	○
a greater variety in types of dwelling (single-family structure, apartment building, duplex, etc.)	○	○	○
larger residential living spaces	○	○	○
better accommodations for car o	○	○	○
closer proximity shopping and establ	○	○	○
better access to shopping centers a h	○	○	○

Rank neighborhood for 13 different characteristics

Characteristics of Neighborhood

- larger private yards
- a greater variety in types of dwelling
- larger residential living spaces
- closer proximity to local shopping and/or retail establishments
- better access to parks and/or outdoor recreational facilities
- better access to regional shopping centers and/or big box stores
- greater population density
- a greater variety of transportation options
- better accommodations for car ownership
- a greater ease for finding parking spaces
- better public transportation service
- better walking environments
- better streets to ride a bicycle for transportation

(3) Validate Image Sets

- Respondents saw differences in density
- Hard to portray transportation network in static images
- Suggests images be supplemented with text to distinguish variation in attributes
- Very urban (A, B, C) and very exurban (E, F) concepts are harder to differentiate
- “Priming-the-pump” is very important

(4) Revise and Apply Tool

Stated-Choice Experiments (SCE) are intended to allow respondents to evaluate **hypothetical** scenarios consisting of various alternatives and attributes describing each alternative.

Benefits:

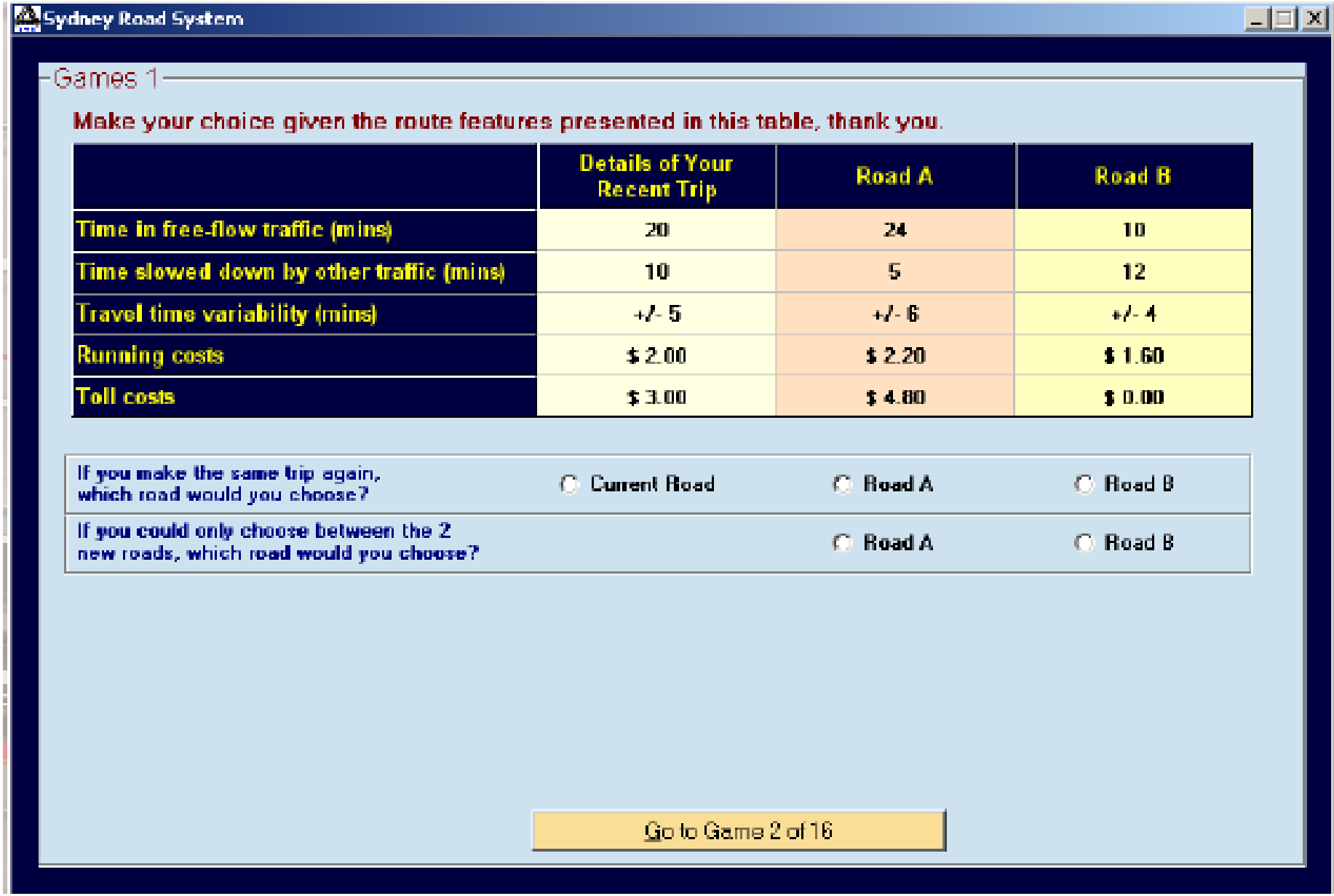
- Supplement revealed preference data & methods
- Evaluate alternatives that do not yet exist
- Access the trade-offs that respondents make
- Investigate variation in utility for different market segments
- Applied within larger travel demand models

Card Number **L02A**

Your Trip:	CAR TOLL ROAD	CAR NO TOLL
Travel time to work	45 min.	70 min.
Time variability	±1 min.	±1 min.
Toll (one way)	$6.00	free
Pay toll if you leave between these times (otherwise free)	6:30-9:00 am	—
Fuel cost (per day)	$6.00	$12.00
Parking cost (per day)	$20.00	$10.00

Your Trip:	BUSWAY	TRAIN
Total time in the vehicle (one way)	30 min.	30 min.
Time from home to your closest stop	Walk 25 min. Car/Bus 8 min.	Walk 5 min. Car/Bus 4 min.
Time to your workplace from the closest stop	Walk 25 min. Bus 8 min.	Walk 5 min. Bus 4 min.
Frequency of service	Every 25 min.	Every 5 min.
Return fare (per day)	$3.00	$3.00

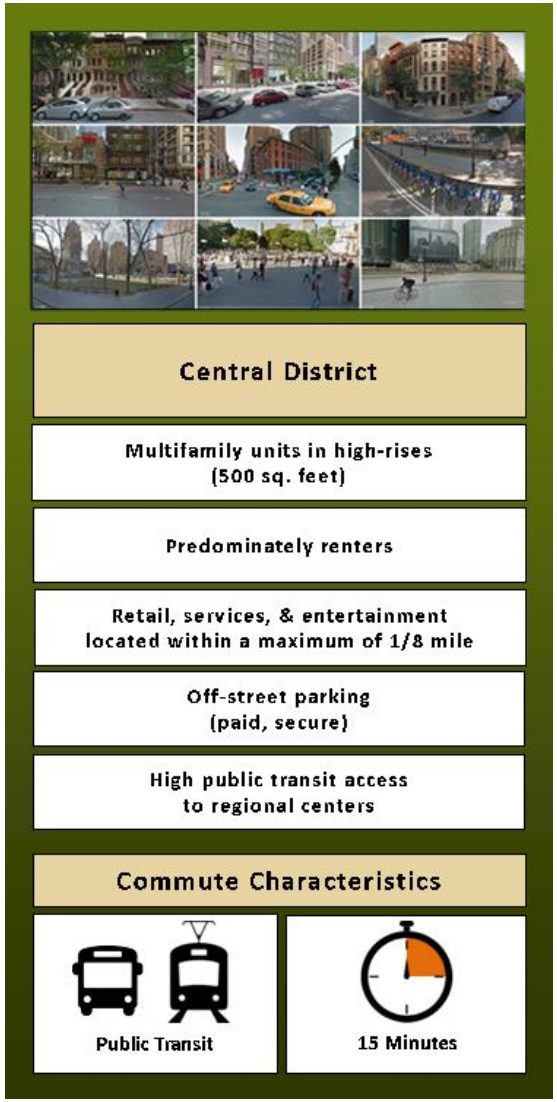
(Hensher et al, 2007)

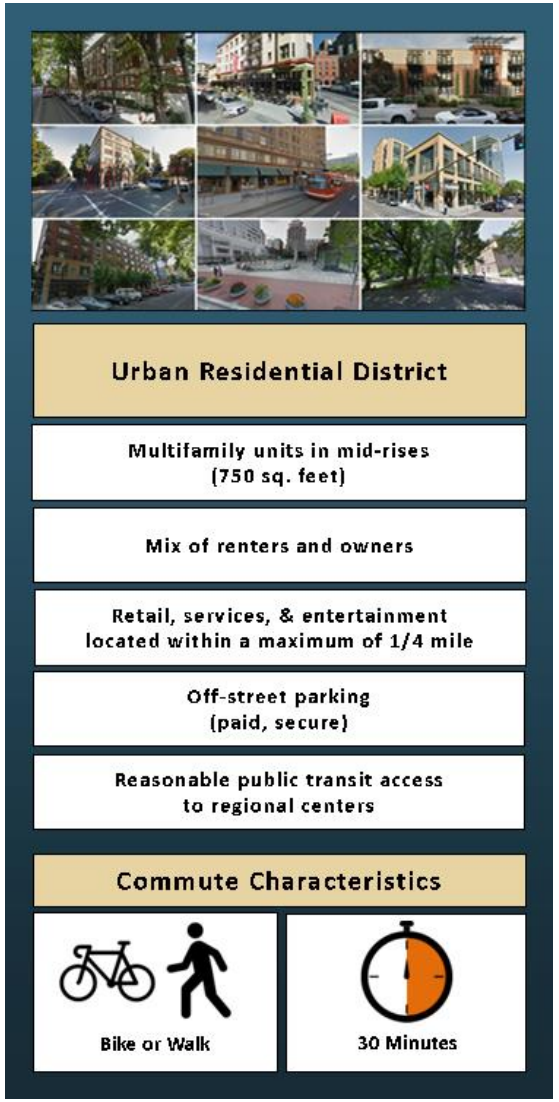


(Hensher & Green, 2003)

Neighborhood and Commute Trade-offs

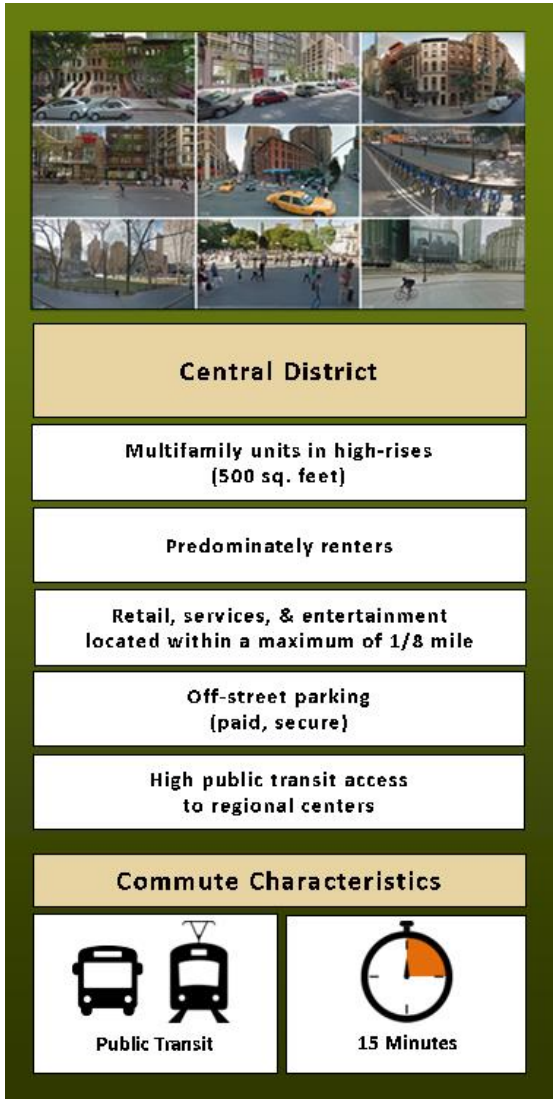
"Of the two options presented, please select the most appealing to you:"

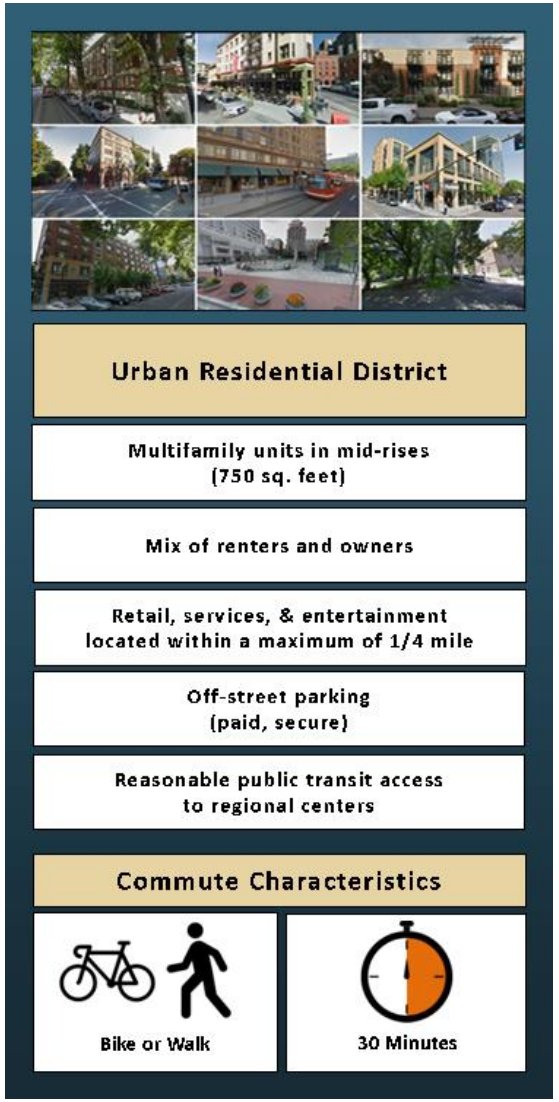




Neighborhood and Commute Trade-offs

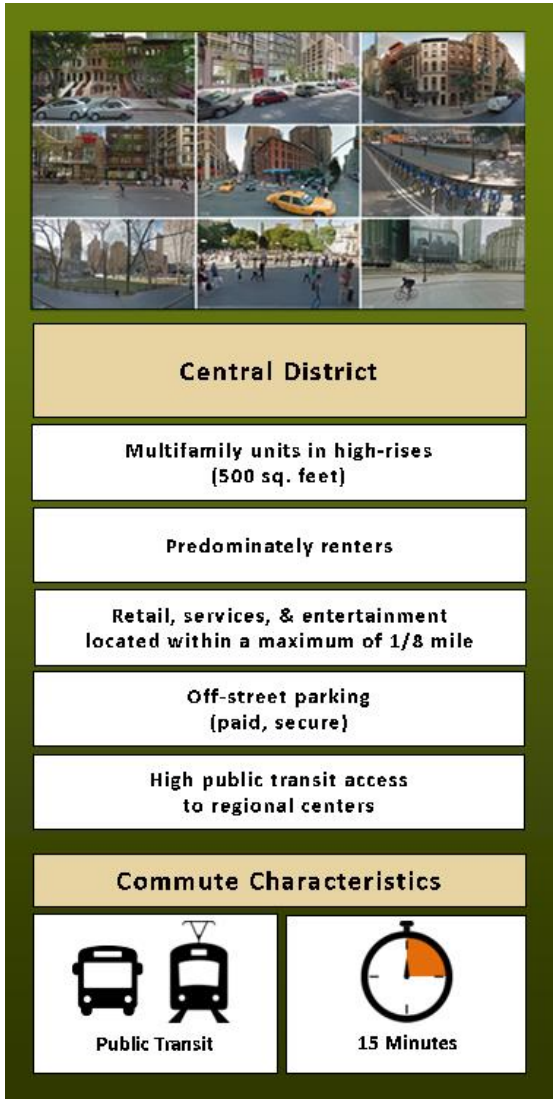
- Summer 2014
- Administered in Qualtrics
- Supplement with desired attribute descriptions

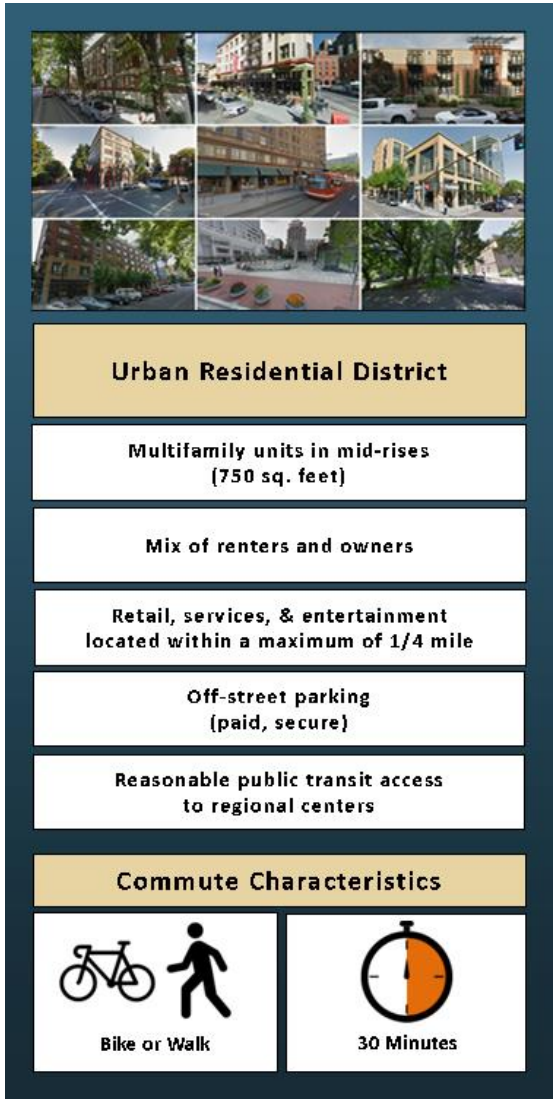




Neighborhood and Commute Trade-offs

- "Cards" with neighborhood images and commute options
- Images are hosted on the web, and linked within survey
- Allow users to examine photos





Future Work
& Lesson’s Learned

Conclusions

- Developed a set of national and objectively defined neighborhood types
- Constructed visuals representing neighborhoods available in Oregon
- Constructed a hypothetical visual tool for neighborhoods not yet available in Oregon
- Using visual tools to describe complex, multidimensional topics help get respondents on the same page

Lesson's Learned

- Pilot surveys indicated importance of "priming the pump" on any elements you want to distinguish
  - Mentioning important neighborhood elements early on in survey
  - Supplementing photo sets with text or description
- Respondents had difficulty seeing differences in transportation networks
- Very urban and very exurban concepts are harder to differentiate

Future Work

- What is the impact of a single photo on the overall understanding of a photo set?
- How do people with different backgrounds (sociodemogrpahic and economic characteristics and preferences) see the visuals differently?
- Analyze results of stated and revealed preference surveys
  - Residential neighborhood and commute trade-offs
- Incorporate visual tool into other surveys to represent neighborhood types

Acknowledgements

%&^*'~ **Happy Birthday, Adam @ PBOT!** ~'*^&%

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References

American Planning Association. “Investing in Place: Two Generations’ view on the future of communities: millennials, boomers, and new directions for planning and economic development.” (2014). Available at https://www.planning.org/policy/polls/investing/pdf/pollinvestingreport.pdf.

Environmental Protection Agency (EPA). Smart Growth Location Database.. Available at http://www.epa.gov/smartgrowth/smartlocationdatabase.htm.

Ewing, Reid; Handy, Susan. “Measuring the Unmeasurable: Urban Design Qualities Related to Walkability.” Journal of Urban Design, Vol. 14, No. 1, 2009, pp. 65-84. Available at http://www.tandfonline.com/doi/abs/10.1080/13574800802451155.

Harrell, Rodney; Lynott, Jana; Guzman, Shannon; and Lampkin, Cheryl. “What is Livable? Community Preferences of Older Adults.” (2014). Available at http://www.aarp.org/content/dam/aarp/research/public_policy_institute/liv_com/2014/what-is-livable-report-AARP-ppi-liv-com.pdf.

Jansen, S., H. Boumeester, H. Coolen, R. Goetgeluk, and E. Molin. The Impact of Including Images in a Conjoint Measurement Task: Evidence From Two Small-Scale Studies. Journal of Housing and the Built Environment, Vol. 24, No. 3, 2009, pp. 271-297. Available at http://link.springer.com/10.1007/s10901-009-9149-x.

Rockefeller Foundation. “Access to Public Transportation a Top Criterion for Millennials When Deciding where to Live, New Survey Shows.” (April 22, 2014) Available at http://www.rockefellerfoundation.org/newsroom/access-public-transportation-top.